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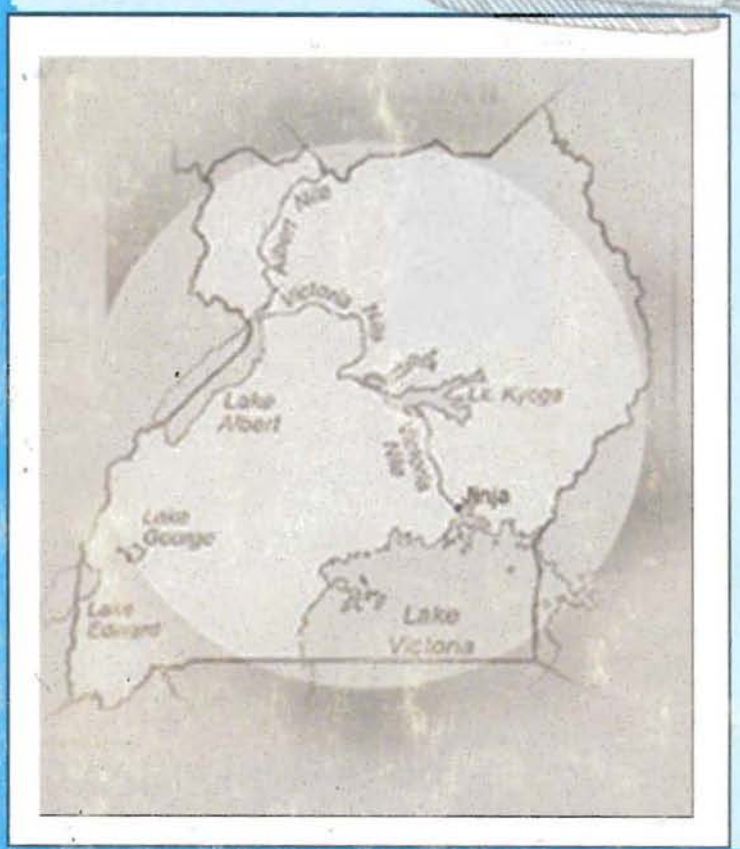
Challenges for Management of the Fisheries Resources, Biodiversity and Environment of Lake Victoria



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Fisheries Resources Research Institute

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LAKE VICTORIA ENVIRONMENT MANAGEMENT PROJECT LAVEMP FOR MAXIMUM SUSTAINABLE BENEFITS

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9.6 Epidemiology of Bilharzia (*Schistosomiasis*) among Fishing Communities of Lake Victoria

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Introduction

The Lake Victoria region has experienced higher population growth rates of 6% per annum with total population of the catchment area now estimated at 30 million. The escalating population has led to increased human activities, particularly fishing which brings fishers in contact with water, causing health concerns related to Schistosomiasis.

Considerable research work on Bilharzia has been done among communities in Uganda (Kabateraine *et. al.,* 1996; Karyabashisha 1988; Kinoti 1982; Prentice 1972), but information on the epidemiology of Schistosomiasis in the fishing communities of Lake Victoria is still scanty. According to MacNalty (1965), epidemiological studies in occupational health have the following five main uses:

1) To identify hazards (primary monitoring),
2) To keep known hazards under control (Secondary monitoring),
3) To find causes and to establish hygiene standards,
4) To enable priorities to be established so that preventive logical action is taken where it is most needed,
5) To evaluate health services and find out how they are used.

In recognition of MacNalty's tenets, this chapter provides information on the prevalence of schistosomiasis, host snail distribution and, the underlying socio-economic influences as a way of incorporating the health of the fisherfolk community in the rejuvenation of a healthy lake ecosystem.

The study was done in six districts of Mukono, Jinja, Iganga, Bugiri, Busia and Kalangala. At both mainland shoreline and islands, 271 adult respondents were randomly selected from 17 landing sites of Lake Victoria over a four months period between October 2000 and January 2001. A questionnaire was administered for symptoms of schistosomiasis and samples of stool, urine and blood were taken

from respondents. Stool and urine were analysed for schistosome eggs and blood. Blood was analysed for increased eosinophils. Snail samples were collected from various depths along the shoreline of study sites identified and screened for schistosome cercariae.

Schistosomiasis

Among human parasitic diseases, Schistosomiasis ranks second to malaria in terms of socio-economic and public health importance in tropical and subtropical areas. The disease is endemic in 74 developing countries, infecting more than 200 million people in rural agricultural and peri-urban areas. Of these, 20 million suffer severe consequences from the disease and 120 million are symptomatic. An estimated 500-600 million people worldwide are at risk from the disease (WHO 1996).

Five species infect man, namely: *(1)*. Schistosomes enter the body through contact with infested surface water. The disease is characterized by damage to the urinary tractis for the case of urinary Schistosomiasis or to the intestine, liver and spleen for the case of intestinal Schistosomiasis. The intermediate host of Schistosomiasis are freshwater snails. The aquatic habitats of these snails are lakes, rivers, fishponds, lagoons impoundments, seasonal pools, reservoirs, drains, and channels of drainage. The snail intermediate hosts are of two genera *Biomphalaria ssp and Bulinus*. *Biomphalaria ssp* are intermediate hosts of intestinal Schistosomiasis while *Bulinus* ssp are intermediate hosts of urinary Schistosomiasis and rectal Schistosomiasis.

In the life cycle of *Schistosoma mansoni* (Fig 9.6.1), adult male and female of Schistosomes found in infected persons. The female lay eggs which can escape through urine and stool of the infected person. When in contact with water, eggs transform into the first larval form called miracidia, ciliate larvae. Miracidia infect snails, the intermediate hosts and multiplicate asexually within 4-6 weeks. After this period, snails release the second larval forms known as cercaria, which affect man.

Schistosomiasis in Uganda

Schistosomiasis was detected in Uganda as early as 1903 (Prentice 1960). It has been reported to be of higher prevalence in the north western part of the country (Karyabashisha 1988). The districts most affected include Nebbi, Arua, Moyo, Apac, Lira, and all those that have shores along the Lake Victoria Basin (Karyabashisha, 1988).

S. mansoni is responsible for the majority of the cases in Uganda especially around Lake Victoria region (Karyabashisha 1988) while, *S. heamatobium* is limited to a few foci in Lira and Apac districts (Kabateraine, Unpublished).

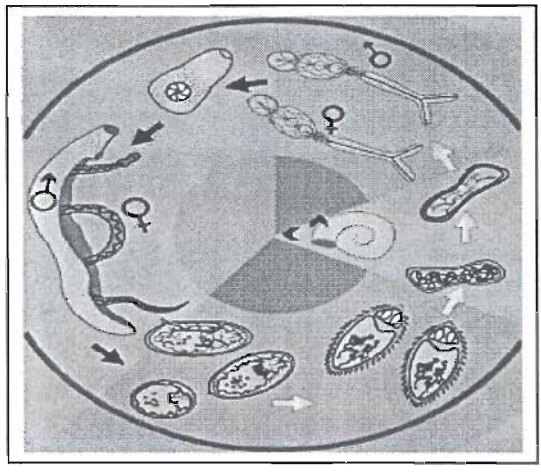

Fig: 9.6.1 Life cycle of *Schistosoma mansoni*
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Schistosomiasis Prevalence in Lake Victoria Communities

Incidences of Schistosomiasis were found in all the six sampled districts. Out of 271 adult people screened for *S. mansoni* 146 were infected, a prevalence rate of 53.8%. cases per district. Jinja district, despite the availability of tap water, had the highest prevalence rate of 80% while Iganga and Bugiri districts both had the same prevalence rate (48%). Morbidity (damage) markers in terms of symptoms were persistent abdominal complaints, which was found in 50% of the respondents. *Schistosoma mansoni* egg shedding in stool was found in 25% of the respondents.

Table 9.6.1: Schistosomiasis Cases in Sampled Districts

District	Sample Size	Schistosomiasis Cases	% Cases Per District
Mukono	56	26	46.4
Jinja	30	24	80
Iganga	48	23	48
Bugiri	50	23	48
Busia	51	29	57
Kalangala	36	21	58.3
Total	271	146	

Source: FIRRI Survey Data, 2001

Snail Type Distribution

Samples of Gastropoda snails obtained from the six sampled districts did not contain the obligatory intermidiate hosts of *B. trigonus* and *B. choanomphala* except in Lutoboka landing in Kalangala district (Table 9.6.2).

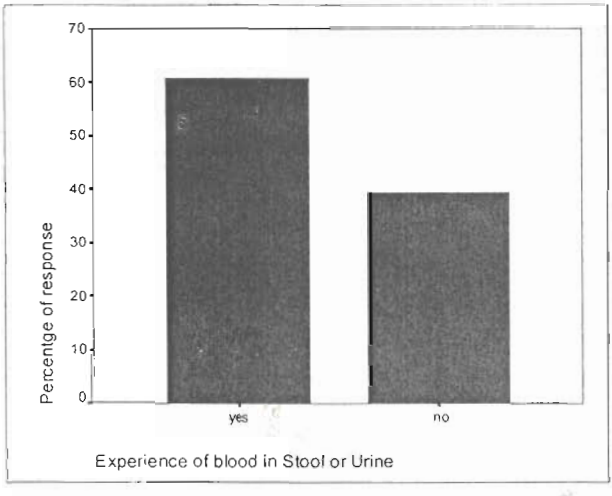
Table 9.6.2: Snail type Distribution

GASTROPODA (Snails)	District					
	Mukono	Jinja	Iganga	Bugiri	Busia	Kalangala
Bellamya unicolar unicolar		49	41	62		
Bellamya unicolar ugandae			10	26		
Melanoides tuberculata dautzenbergi	8		24	3		
Pila ovata gordoni						
Bellamya unicolar constricta	53	7				
Bullinus trigonus						4
Biomphalaria choanomphala						1
Lymnaea natalensis						1
Bellamya unicolor trochlearis						17
Pila ovata gordoni						6

Source: FIRRI Survey Data, 2001

Perceptions of fishers on Schistosomiasis Symptoms

The majority of fishers (61%) reported experience of blood in their stool and urine (Fig. 9.6.2) while 62% of the 271 respondents had coughed long round worms. Furthermore, symptoms revealed that 16% of 271 respondents had had diarrhoea with blood in stool and pain in the stomach which are common symptoms of Schistosomiasis.



Source: FIRRI Survey Data, 2001

Fig.9.6.2: Percentage experience by fishers with blood in Stool and urine

Health Practices of Fishers

Most respondents (95%) owned latrines although observations revealed that most landing sites only had one publicly owned latrine. Of the 271 respondents, 43% reported that their latrines were in bad condition. About where most fishers drew water for domestic use, 60% reported the lakeshore, with the most common method of drawing water as stepping in the lake (70% of the respondents) a practice that makes fishers more prone to Schistosomiasis. Concerning the specific category of people who drew water from the lake, results showed that it was commonly an activity for women (64% of respondents). About 23% reported that they did not treat water for domestic use.

Health Facilities in Fishing Communities

Fishers' vulnerability to the disease is enhanced by inaccessibility to both health facilities and personnel. Most respondents (56%) reported that the nearest health units were of beyond one kilometre. Even then, on station qualified health workers were lacking (58%) away from their localities at the units. On the issue of health related programmes, fishers reported that they received such programmes once in three months. On assessing what they got sensitised about during such programs, nothing about Bilharzia (Schistosomiasis) was reported.

Community Health Indicators

The Key indicators examined were literacy levels of fishers and house hold population sizes. There were higher illiteracy levels among fishers. The biggest proportion 57% of fishers had acquired only primary level education and 24% had not acquired any formal education (Table 3). Population per household was between 3-8 members as reported by 51% of the fishers.

Table 9.6.3: Literacy Levels of Fishers

Education Levels	Frequency	Percentage
Primary	139	57.7
Secondary	42	17.4
Tertiary	2	0.8
None	58	24.1
Total	241	100%

Source: FIRRI Survey Data, 2001

Conclusion

The study has revealed a high prevalence rate of 53.8%, much higher than the acceptable level of 18% (WHO. 2000). High Infection prevalence related to districts where fishing activities are known to be high and population unstable. This relates to the deteriorating water quality of the lake which factor supports the growth of intermediate host, and the poor health practices and inadequate sanitation facilities available to fishers.

There were no obligate intermediate host snail types encountered at most landing sites, except at Lutoboka in Kalangala District. Deficiencies in obligate intermediate host snail data at other sites could have resulted from a limited sample area.

Recommendations

In view of the high prevalence of Schistosomiasis established in this study and the various influences identified, fisheries management in conjunction with other institutions' concerns should target Schistosomiasis reducing program, which takes into account treatment, prevention and sanitation improvement measures. Such measures should include:

a) Mass treatment of the fishing communities with praziquantel at 40 mg /kg body weight at a yearly interval.
b) Provision of both health units and personnel to members of the fishing communities.
c) Provision of safe water and sensitisation on appropriate health practices particularly to the women and children.
d) The fisherfolk should be encouraged to put on gumboots when stepping in lake water.
e) General improvement of fishers' ways of life with special emphasis to education and household management.

However, note should be taken of other preventive methods on Lake Victoria which might be appropriate but costly and environmentally devastating for instance, spraying of molluscids. The current molluscide of choice (Baymscide) is very expensive and kills other flora and fauna indiscriminately and it would not be acceptable in a fishing community. Related to this, is environmental snail control such as clearing of vegetation at water landing sites, which deprive snails of their food, shelter and breeding sites.